

REMARKS

The Office Action notes that Claims 1-18 are pending in the application. By this amendment, Claim 5 has been amended. The amendment to Claim 5 was purely formal in nature to address the objection to Claim 5. Therefore, no new matter has been added. Claims 1-18 remain pending.

Claims 1-7 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Tobe, et al. (U.S. Patent No. 6,0080,446).

Independent Claim 1 provides a method of forming a titanium nitride thin film on a substrate disposed on a susceptor in a reaction chamber. The method comprises:

feeding vaport of a Tetrakis Diethylamino Titanium (TDEAT) precursor and ammonia (NH₃) gas into the reaction chamber, wherein a ratio of a vaporization rate of the TDEAT precursor to a flow rate of the ammonia gas is a value in the range of 1 mg/min : 20 sccm to 1 mg/min : 100 sccm;

maintaining an atmosphere in the reaction chamber at a pressure in the range of 0.5 to 3.0 Torr; and

heating the substrate to a temperature in the range of 300 to 400 degrees Celsius (°C).

The Applicants respectfully submit that Independent Claim 1 is not unpatentable over Tobe, et al. because Tobe, et al. does not teach or suggest at least one of the range limitation provided in Claim 1. Moreover, the range recited in Claim 1 and the range in Tobe are not close enough to reasonably expect the achievement of similar results.

Specifically, Claim 1 provides for “maintaining an atmosphere in the reaction chamber at a pressure in the range of 0.5 to 3.0 Torr” which is equivalent to 66.66 Pa to 399.66 Pa. In contrast, Tobe is cited by the Office Action as disclosing a pressure of about 0.1 to 15 Pa. The Office Action asserts that “the pressure of Tobe is slightly below Applicants’ lower limit. However, it would have been obvious to have used pressures in the claimed range which are slightly above that disclosed in the prior art given the small difference with a reasonable expectation of achieving similar results.” (Page 3, lines 3-5). The Applicants respectfully submit that a difference in range of 0.1 to 15 Pa and 66.66 to 399.66 Pa is not “small.” The

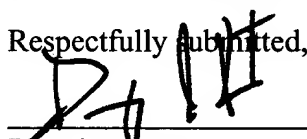
limit of Tobe's upper range of 15 Pa to the lower range in Claim 1 of 66.66 Pa is a difference of 340%. Moreover, the Office Action provides no support for the assertion that the difference in range would provide the expectation of achieving similar results. The Applicants are aware of the case law indicating that slight difference in ranges can be deemed *prima facie* obvious if there is a reasonable expectation of similar results, but the Applicants respectfully submit that 340% is not slight. Further, the Applicants submit that such a difference would not lead to a reasonable expectation of similar results. Accordingly, the Applicants respectfully request reconsideration of the rejection of Claim 1.

The remaining claims are dependent either directly or indirectly on Claim 1 because dependent claims necessarily include the limitations of their base claims and any intervening claims, the Applicants respectfully submit that the dependent claims are allowable for the same reasons as given with respect to Claim 1.

If the Examiner believes that an interview with the Applicants or the Applicants' attorney would speed the allowance of the present application, the Applicants' attorney respectfully requests that the Examiner contact the same.

In view of the aforesaid, Applicants respectfully submit that all pending claims are in the condition for allowance. Favorable reconsideration is requested.

Respectfully submitted,

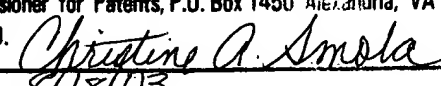


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